Remarks

Claims 1-36 remain pending in the present application, of which claim 18 has been amended. It is respectfully submitted that the pending claims define allowable subject matter.

Initially, the examiner is thanked for indicating claims 9, 19 and 20 to be allowable and claims 3, 6, 11-17, and 21-36 to be allowed. Claim 18 has been amended to incorporate allowable subject matter. Applicant maintains the objection or record to the reasons for allowance and reserves the right to pursue broader protection in a subsequent application, reissue, reexamine and the like.

Turning to the sole outstanding rejection, claims 1-2, 4-5, 7-8, 10 and 18 have been rejected under 35 U.S.C. 103(a) as being unpatentable over Johnson et al. (USP 6,216,064) in view of McBurney et al. (USP 6,055,477). Applicant respectfully traverses this rejection for reasons set forth hereafter.

First, even if the teachings of Johnson and McBurney were combined, the combination still would not render obvious the claimed invention. Claim 1 recites a navigation device comprising, among other things, a barometric altimeter, a processor, and a filter. The processor calculates a difference between the barometric elevation readings and GPS elevation readings. The filter filters this difference and is adjustable between a short time constant and a long time constant based on a time lapsed since a predetermined event.

In the Office Action, it is noted that Johnson does not teach or suggest "said processor calculating differences between said barometric elevation readings and said GPS elevation readings; said filter filtering said differences to produce a barometer correction quantity, said filter being adjustable between a short time constant a long time constant." The Office Action goes on to suggest that McBurney makes up for this deficiency of Johnson. Applicant strongly disagrees.

McBurney does not filter the difference with a filter that is adjustable between short and long time constants based on a time lapse since a predetermined event. Four sections of McBurney are cited in the Office Action as the basis for this proposition, namely col. 10, lines 47-58; col. 12, lines 34-67; col. 13, lines 1-67 and col. 14, lines 1-37. Each noted section of McBurney has been closely reviewed, along with the remainder of McBurney's teachings.

Nowhere does McBurney suggest using a filter to filter the claimed difference where the filter is adjustable in the claimed manner based on a time lapse since a predetermined event.

Of the noted sections of McBurney, the passage at col. 12, lines 34-67, appears the most relevant. McBurney states the following:

> In a second technique, a sequence of GPS-determined altitude estimates is used to calibrate the sensor 27. In this situation, the user 11 recognizes that most of the errors in the sensor-determined altitude and in the GPS-determined altitude have zero mean random components that can be reduced through signal averaging or filtering. Thus, the difference, or residual, between the sensor-measured altitude value and the GPS-determined altitude is formed and is blended with the previous estimate of the altitude sensor bias $B(t_n)$, using a selected scalar blending factor.
>
> This technique is general and includes all scalar Kalman filters and fixed gain filters that reduce to a first order low-pass filter. Typically, the filter gain (K_n) on the new residual depends on the variance of the last altitude calibration and on the variance of the current residual, which includes the variance of the sensor noise and the error of the GPS-determined altitude. Kalman filtering is discussed by R. G. Brown and P. Hwang in Random Signal Analysis and Kalman Filtering, John Wiley & Sons, Second Edition, 1995, especially pages 409-455, the information in this material being incorporated by reference herein.(column 12, lines 34-54).

From the foregoing, it is clear McBurney suggests using a scalar Kalman filter or a fixed gain filter to blend previous estimates of the altitude sensor and the current residual between the GPS determine altitude and the sensor-measured altitude. The filter is not picked based on a time lapse since a predetermined event, but instead the "filter gain (Kn) on the new residual depends on the variance of the last altitude calibration and on the variance of the current residual." (col. 12, lines 46-50). Hence, even if combined, Johnson and McBurney fail to render obvious the claimed invention.

Further, no motivation exists to modify Johnson's system with the teachings of McBurney as suggested in the Office Action. Johnson describes a method for determining altitude based, in part, on the vertical figure of merit (VFOM) which estimates the accuracy of the GPS altitude. Johnson states the following:

> The filter time constant, Tau or T, is a function of the current GPS figure of merit. The lower the GPS VFOM, the lower the time constant. Therefore the more accurate the GPS is, the more quickly the output follows the GPS altitude. When accuracy of the GPS degrades, the output more closely follows pressure altitude. When the GPS figure of merit increases, the filter stops tracking. (Col. 10, lines 8-15).

Neither McBurney nor Johnson provide any suggestion that McBurney's Kalman filter would be useful or advantageous in Johnson's system. Instead, it is submitted that the person of ordinary skill would be motivated to NOT replace Johnson's VFOM based filter with a Kalman filter since a Kalman filter provides no direct estimate of the accuracy of the GPS altitude. It is fundamental to Johnson's system that the accuracy of the GPS altitude be accounted for in the filtering process. McBurney's Kalman filter does not include any such measure of GPS altitude accuracy. Therefore, it is submitted that the person of skill would not have been motivated to replace Johnson's filter with McBurney's filter. Hence, claim 1 is neither anticipated, nor rendered obvious, by the prior art.

In view of the foregoing, it is respectfully submitted that the pending claims define allowable subject matter. Should anything remain in order to replace the present application and condition for allowance, the examiner is kindly invited to contact the undersigned at the telephone number listed below. A favorable action on the merits is respectfully requested.

Respectfully Submitted,

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